WHAT IS CLAIMED:

1. A creep resistant zirconium alloy comprising a coarse grained lath alpha microstructure.

2. The zirconium alloy as claimed in claim 1 wherein the microstructure includes small second phase precipitates.

3. The zirconium alloy as claimed in claim 1 wherein the small second phase precipitates have a diameter less than 0.15μm.

4. The zirconium alloy as claimed in claim 3 wherein the microstructure is partially recrystallized.

5. The zirconium alloy as claimed in claim 4 wherein the microstructure is less than 50% recrystallized.

6. The zirconium alloy as claimed in claim 1 wherein the microstructure has an acicular structure which includes a lath spacing within the range from about 0.5 to about 3.0μm.

7. The zirconium alloy as claimed in claim 5 wherein the microstructure is an acicular structure and includes a lath spacing within the range from about 0.5 to about 3.0μm.

8. A nuclear fuel cladding comprising an annular layer of the creep resistant zirconium alloy as claimed in claim 1.

9. A nuclear fuel cladding comprising an annular layer of the creep resistant zirconium alloy as claimed in claim 7.

10. A method of manufacturing a creep resistant zirconium alloy comprising the steps of:

beta heat treating a zirconium alloy to form a first intermediate;

fast quenching the first intermediate to form a second intermediate;

cold working the second intermediate within the range from about 30% to about 40% to form a third intermediate; and

annealing the third intermediate to effect partial recrystallization.

11. The method as claimed in claim 10 wherein the beta heat treating step has a duration within the range from about 1 to about 10 seconds.

12. The method as claimed in claim 11 wherein the fast quenching step is conducted at a cooling rate within the range from about 20 to about 200°C/second.

13. The method as claimed in claim 12 wherein the annealing step is conducted within the temperature range from about 570°C to about 640°C.

14. A fuel cladding for use in a nuclear reactor for cladding nuclear fuel, comprising:

a tube member; and

said tube member comprised of a zirconium alloy, said alloy having a coarse grained lath alpha microstructure.

15. The nuclear fuel cladding as claimed in claim 14, wherein said microstructure includes a lath spacing within the range from about 0.5 to 3.0μm.

16. A fuel cladding for use in a nuclear reactor for cladding nuclear fuel, comprising:

a tube member; and

said tubular member having an inner annular layer, which forms an inner diameter of said tubular member,

said annular layer comprised of a zirconium alloy, having a course grained lath alpha microstructure.

17. A fuel cladding as claimed in claim 16, wherein said microstructure includes a lath spacing in the range of 0.5 to 3.0μm.

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